

Special Committee appointed by the Society on May 20, 1887, to examine into the merits of a communication for the Magellanic Premium, signed "*Magellan*," upon "The Physical Phenomena of Harbor Entrances; Their Causes and Remedies; Defects of present Methods of Improvement," and with the same the statement that the Council approved of the recommendation that the Magellanic Premium should be awarded therefor.

A paper entitled "Notes on the Ethnology of British Columbia," by Dr. F. Boas, was presented through the Secretaries.

Dr. Brinton read a paper on "An Ancient Human Footprint from Nicaragua," of which he exhibited a specimen, and in the discussion that ensued Prof. Heilprin stated that in his opinion the deposit in which it occurred was not of the Eocene period, but was Post-pliocene.

Prof. E. F. Smith (Springfield, Ohio) presented (through the Secretaries) a paper on "Electrolysis of Lead Solutions."

Pending nomination No. 1171 and new nomination No. 1172 were read.

Prof. Edwin J. Houston made the following oral communications :

On a Non-Magnetizable Watch.

C. A. Paillard, of Geneva, Switzerland, after some fourteen years' experimentation, has succeeded in producing a watch that is entirely destitute of any magnetizable material.

The rapid growth of electric lighting and electric railways renders the magnetization of watches a matter of frequent occurrence, and the injury to the accuracy of time-pieces occasioned by inadvertently entering the magnetic field of the dynamo-electric machines, or motors producing the current, is well known.

Heretofore a magnetic shield, consisting essentially of an iron-encasing box, has been employed to protect the works of the watch against the influence of an external magnetic field. Such shields are, for the greater part, clumsy and heavy.

Mr. Paillard's invention effects the protection of the watch in a much more thorough manner, and does so without rendering it any heavier.

It will be seen that the problem Mr. Paillard set himself to solve, was

to produce an alloy or metallic substance that possesses the following properties, viz :

- 1st. It must be non-magnetic.
- 2d. It must resist rusting and oxidation.
- 3d. It must be permanently elastic.

These properties he has obtained in an alloy of palladium.

By the combination of two alloys containing different quantities of palladium, Mr. Paillard has succeeded in obtaining accurate compensation for changes of temperature in the balance wheels of his watches.

On the Gramophone.

Mr. Emil Berliner, of Washington, D. C., has recently made improvements in the speaking phonograph that, it would seem, will probably bring this instrument into every-day commercial use. These inventions are of such a character as, possibly, to a great extent, to render phonography, or short-hand reporting, one of the lost arts.

There have been two causes for the failure of Mr. Edison's phonograph to come into extensive use. These are briefly :

1st. The perishable nature of the phonogram record, which, being made on a sheet of tin-foil, was capable of reproducing the original sound a limited number of times only.

2d. The inability of the phonograph, as originally constructed, to correctly reproduce the sounds spoken into it. The pitch or tone was correctly reproduced, provided the point attached to the diaphragm of the receiving instrument was moved over the phonogram-record at the same velocity that it had while in the receiving instrument. The quality of the tone, on the preservation of which the ability to distinguish the speaker's voice depends, could not, however, be obtained to the extent a practical instrument demands. This arises not only from the fact that the original instrument failed to correctly impress on the phonogram-record the relative intensities of the over-tones, on which the quality depends, but also on the fact that the receiving instrument was unable, from the relative positions these impressions bore to the surface of the phonogram-record, to always correctly reproduce them.

These difficulties Mr. Berliner has, to a very great extent, overcome in an instrument called by him the gramophone.

The direction in which these improvements have been made is mainly in the manner in which the receiving diaphragm of the instrument is caused to leave an impression of its movements on the phonogram-record. In the Berliner instrument, unlike the original Edison instrument, the to-and-fro movements of the diaphragm are received by the plate in a direction parallel to its surface, and not in a direction at right angles thereto. By this change the movements are recorded as a sinuous line of even depth, instead of a sinuous line of varying depths.

It results from this difference that the resistance offered by the plate to the free movements of the transmitting diaphragm is reduced to a mini-